

CLAIMS

What is claimed is:

1. A bias circuit used in switch-mode power converters having a input and a output
2 side, the bias circuit providing initial bias and enable signal for a control circuit located on the
output side of the switch-mode power converter, the circuit comprising:

4 an isolated coreless transformer;
5 a driver to drive said coreless transformer;
6 a rectifier to provide positive pulses at the output of said coreless transformer;
7 a capacitor for smoothing the rectified positive pulses; and
8 apparatus to enable said control circuit located on the output side of said switch-mode
power converter.

10 2. The bias circuit recited in claim 1, wherein said driver comprises:

2 a circuit that when enabled generates pulses of predetermined duration followed by a
relatively long inactive period;
4 an oscillator that generates high frequency pulses in response to said circuit generated
pulses; and
6 a driver to drive said coreless transformer in response to the output of said oscillator.

3. The bias circuit recited in claim 1, and further comprising an ON/OFF feature,
2 wherein said ON/OFF feature comprises apparatus to disable said coreless transformer and thus
the control circuit located on the output side in response to a signal initiated on the input side.

4. The bias circuit recited in claim 1, and further comprising apparatus to disable
2 said coreless transformer and thus said control circuit in response to a signal initiated on the
output side.

5. The bias circuit recited in claim 1, wherein the enable signal is a single pulse of
predetermined duration.

6. The bias circuit recited in claim 1, wherein the enable signal is a train of pulses of
predetermined duration and predetermined period.

7. The bias circuit recited in claim 6, wherein the predetermined duration of each
2 said pulse in the enable signal is short compared with the period of the pulses.

8. The bias circuit recited in claim 1, wherein the enable signal is a single pulse, the
2 duration of which is determined by the time from the commencement of the enable signal until
said converter commences operating.

9. The bias circuit recited in claim 8, wherein the enable signal has a predetermined
2 inactive period following the duration of the single pulse.

10. The bias circuit recited in claim 2, wherein said oscillator operates continuously
2 at a reduced frequency after a predetermined time.

11. The bias circuit recited in claim 2, wherein said oscillator operates continuously at
20 a reduced frequency after said converter commences operating.

12. The bias circuit recited in claim 1, wherein the voltage from said driver drives
2 said coreless transformer is reduced after a predetermined time.

13. The bias circuit recited in claim 1, wherein the voltage from said driver drives
20 said coreless transformer is reduced after said converter commences operating.

14. The bias circuit recited in claim 1, and further comprising a sensor on the output
2 of said coreless transformer, said sensor disabling said control circuit pursuant to sensing that
said coreless transformer has no output.

15. The bias circuit recited in claim 1, and further comprising a sensing and control
2 circuit coupled to the input side of said bias circuit to detect when said converter is not operating,
said sensing and control circuit commencing an inactive period for operation of said converter.

16. A bias circuit used in switch-mode power converters having a input and a output

2 side, the bias circuit providing initial bias and enable signal for a control circuit located on the output side of the switch-mode power converter, the circuit comprising:

4 an isolated coreless transformer;

driving means to drive said coreless transformer;

6 rectifier means to provide positive pulses at the output of said coreless transformer;

capacitor means for smoothing the rectified positive pulses; and

means to enable said control circuit located on the output side of said switch-mode power

converter.

17. The bias circuit recited in claim 16, wherein said driving means comprises:

a circuit that when enabled generates pulses of predetermined duration followed by a relatively long inactive period;

oscillator means that generates high frequency pulses in response to said circuit generated pulses; and

6 a driver to drive said coreless transformer in response to the output of said oscillator.

18. The bias circuit recited in claim 16, and further comprising an ON/OFF feature,

2 wherein said ON/OFF feature comprises apparatus to disable said coreless transformer and thus

the control circuit located on the output side in response to a signal initiated on the input side.

19. The bias circuit recited in claim 16, and further comprising apparatus to disable
2 said coreless transformer and thus said control circuit in response to a signal initiated on the
output side.

20. The bias circuit recited in claim 16, wherein the enable signal is a single pulse of
2 predetermined duration.

21. The bias circuit recited in claim 16, wherein the enable signal is a train of pulses
of predetermined duration and predetermined period.

22. The bias circuit recited in claim 21, wherein the predetermined duration of each
said pulse in the enable signal is short compared with the period of the pulses.

23. The bias circuit recited in claim 16, wherein the enable signal is a single pulse, the
2 duration of which is determined by the time from the commencement of the enable signal until
said converter commences operating.

24. The bias circuit recited in claim 23, wherein the enable signal has a predetermined
2 inactive period following the duration of the single pulse.

25. The bias circuit recited in claim 17, wherein said oscillator operates continuously
2 at a reduced frequency after a predetermined time.

26. The bias circuit recited in claim 17, wherein said oscillator operates continuously
2 at a reduced frequency after said converter commences operating.

27. The bias circuit recited in claim 16, wherein the voltage from said driver drives
2 said coreless transformer is reduced after a predetermined time.

28. The bias circuit recited in claim 16, wherein the voltage from said driver drives
said coreless transformer is reduced after said converter commences operating.

29. A method employing a coreless transformer for providing initial bias and enable signal for a control circuit on the output side of a power converter, the method comprising:

- driving the coreless transformer using high frequency pulses;
- enabling the secondary control circuit using said coreless transformer; and
- providing initial bias to the power converter using said control circuit referenced to the output of the converter and associated circuitry to properly bias the power converter from the primary side.